1. A set of data whose histogram is bell shaped yields a sample mean and standard deviation of 50 and 4, respectively. Approximately what proportion of observations are:

a) Between 46 and 54?

b) Between 42 and 58?

c) Between 38 and 62?

2. Calculate the first, second, and third quartiles for the following sample.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 5 | 8 | 2 | 9 | 5 | 3 | 7 | 4 | 2 | 7 | 4 | 10 | 4 | 3 | 5 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

3. There is a garbage crisis in North America – too much garbage and no place to put it. As a consequence, the idea of recycling has become quite popular. A waste-management company in a large city is willing to begin recycling newspapers, aluminum cans, and plastic containers. However, it is profitable to do so only if a sufficiently large proportion of households are willing to participate. In this city, 1 million households are potential recyclers. After some analysis it was determined that, for every 1,000 households that participate in the program, the contribution to profit is $500. It was also discovered that fixed costs are $55,000 per year. It is believed that 50,000, 100,000, 200,000, or 300,000 households will participate with probabilities of .5, .3, .1, and .1, respectively. A preliminary survey was performed where 25 households were asked whether they would be willing to be part of this recycling program.

Suppose only 3 of the 25 respond favorably. Incorporate this information into a decision-making process to decide whether the waste-management company should proceed with the recycling venture.

4. Suppose the following statistics were calculated from data gathered from a randomized block experiment with k = 4 and b = 10:

|  |  |  |
| --- | --- | --- |
| SS(total) = 1,210 | SST = 275 | SSB = 625 |

(a) Can we conclude from these statistics that the treatment means differ? (use α =.01)

(b) Can we conclude from these statistics that the block means differ? (Use α = .01)

5. A random sample of 50 observations yielded the following frequencies for the standardized intervals:

|  |  |
| --- | --- |
| Interval | Frequency |

|  |  |
| --- | --- |
| Z ≤ - 1 | 6 |

|  |  |
| --- | --- |
| -1 < Z ≤ 0 | 27 |

|  |  |
| --- | --- |
| 0 < Z ≤ 1 | 14 |

|  |  |
| --- | --- |
| Z >1 | 3 |

Can we infer that the data are not normal? Use α = .10.